



A
SERIES OF OBSERVATIONS
ON
STRICTURES OF THE URETHRA;
WITH AN ACCOUNT OF A
NEW METHOD OF TREATMENT,
SUCCESSFULLY ADOPTED IN CASES OF THE MOST OBSTINATE AND
AGGRAVATED FORM OF THAT DISEASE.
ILLUSTRATED BY CASES AND A PLATE.

BY
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TO
JOHN ABERNETHY, ESQ. F.R.S.

LATE SURGEON TO ST. BARTHOLOMEW'S HOSPITAL,
&c. &c. &c.

MY DEAR SIR,

IT is unnecessary, and it might even appear presumptuous in me to speak of your talents, of the new and powerful light which your original investigations have introduced into important departments of pathology and therapeutics, and of the impulse which your example has given to the cultivation of surgical science. I dedicate this little work to you, not to discharge, but to acknowledge, a debt of private obligation. The precepts which I learned from your Lectures, and the invaluable

opportunities which I enjoyed, as House-Surgeon to St. Bartholomew's Hospital, under your nomination and direction, of seeing those precepts practically illustrated, inspired me with a love of the profession, while they disclosed, in the most interesting manner, its extent and resources. For these great advantages, for numerous personal favors, and for an uninterrupted series of friendship and kindness, accept, my Dear Sir, the grateful thanks, the affectionate regards, and the best wishes, of

Your obliged and obedient Servant,

R. A. STAFFORD.

35, ARGYLL-STREET, }
July 16th, 1828. }

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INTRODUCTION.

IN the following work I have not attempted to enter into the minute details of the disease. This would have far exceeded the limits of my pages ; and, at the same time, so much has already been written on Strictures of the Urethra, that it would have been merely a work of supererogation. My chief object has been to introduce to the notice of the Profession a new method of treating the more obstinate and aggravated forms of this complaint,—a department in surgery which has hitherto been very defective ; and to make a few remarks upon its most important points. I think it proper to state, that most of the Cases

related at the end of this Treatise occurred in Hospitals and Public Charities; and I beg here to thank the Surgeons of those Institutions for the opportunities they have afforded me of employing the Lancetted Stilettes, from which so much benefit has been derived.

35, ARGYLL-STREET, }
July 16th, 1828. }

OBSERVATIONS
ON
STRICTURES OF THE URETHRA,
&c. &c.

CHAP. I.

*Of Spasmodic Stricture and its causes ;—of the
“ Mixed Case,” or Inflammatory Stricture ;—of
Permanent Stricture and its causes ;—and of
Excrescences.*

It is proposed, in the present Treatise, to make a few observations upon Strictures of the Urethra generally. But having invented certain instruments, which I have found effectual in relieving the most obstinate and distressing forms of Permanent

Stricture, it is to that class I am more particularly anxious to direct the attention of the profession. The unyielding nature of this complaint, the inefficacy of the usual modes of treatment, and the intense suffering, as well as the extreme danger of the patient, will, I trust, be deemed a sufficient apology for not losing time in submitting the result of my experience to the public.

Strictures of the urethra have been divided by Mr. Hunter into three different classes,—the Permanent, the “Mixed case,” and the true Spasmodic. I shall first make some remarks on spasmodic strictures, as being the most simple. This form of stricture arises from the whole, or part of the canal of the urethra, being so highly irritable that the slightest stimulus will cause it to contract, and occasion the stream of urine to be suddenly obstructed. The disposition

to spasm exists according to the constitutional excitability of the patient, or to the peculiar state of the canal; and it usually occurs in that portion of the urethra which, under natural circumstances, is the most irritable. Spasmodic strictures are very constantly the result of faulty digestion; and this is explained from the morbid irritability of the stomach extending its influence and sympathies to all other structures. Hence I have known a spasmodic stricture follow from eating of high-seasoned dishes and indigestible food, such as pastry, &c.; or from drinking subacid liquors, such as champaign, cider, &c.; and the proof that the spasm, in these cases, depends solely upon this cause, is shewn from the fact, that if the irritating substance be carried off, or the acid neutralized, the spasmodic state of the urethra ceases. In some persons, the mere acrimony of the urine will bring on this affection. Faulty

digestion, and many other causes, may produce this acrimony ; and there are few of us who do not, at different times, experience changes in the secretion of this fluid. It at one time shall be limpid and unirritating, and at another so heated as to cause a burning sensation as it makes its exit. This irritating quality arises partly from the salts of the urine being in greater quantity, and partly from there being less fluid to hold them in solution. If these two causes are combined, namely, the predisposition from increased general irritability of the system, and a concentrated state of the urine, we cannot be surprised if the urethra be excited to inordinate contraction, and the patient suffer from spasmodic stricture. Besides this stimulating condition of the urine, where the general irritability exists, any other local cause will occasion stricture. Hence a bougie may become this cause, and we find at one

time it will pass freely, while at another it will be arrested. The force of the contraction will also vary : in some cases a steady and continued pressure for a short time will overcome the spasm ; in others, the stricture will resist it altogether, although the force employed to pass the bougie shall have been sufficient to con-tort it.

Much discussion has arisen as to the manner in which this contraction in the urethra is produced ; and it has been argued by some, that it never takes place in a situation anterior to that part of the urethra which is not surrounded by the accelerator urinæ, or ejaculator seminis, the sphincter vesicæ, the compressor prostatae, and the levator ani muscles, and that these alone are the cause of the contraction. By others, spasmodic stricture is asserted to occur in the other parts of

the canal, in muscular fibres which they have supposed encircle the urethra throughout its whole length. From the latest examination of its structure, made by Mr. Bäuer with the microscope, under the direction of Sir Everard Home, the latter gentleman infers that * “the urethra, along its whole extent, being made up of two parts, an internal membrane, and an external muscular covering,” and that the muscular covering, “being made up of fasciculi of very short fibres, which appear to be interwoven together, and connected by their origins and insertions with one another,” the disposition to spasm exists in these. It is not necessary, however, for my present purpose, to inquire into the merits of these several opinions. I would only observe, as it appears to me, that the texture of the urethra is so very minute

* Home on Stricture, vol. iii. p. 26—28.

that it would be difficult to form any accurate opinion of its real structure, and consequently of the causes of spasm in this canal. It is sufficient to know that it possesses a contractile tendency to an extreme degree ; and, as far as my own experience goes, I should conceive that the whole of the urethra may be affected by spasm, but that it is more active at that part of it where it is surrounded by the muscles necessary to the performance of its natural functions.

The “Mixed Case,” according to the explanation given of it by Mr. Hunter, that it is * “composed of a permanent stricture and a spasm,” includes all those strictures where inflammation is present without an organic change having taken place, and all those, also, where the part has only

* Hunter on Venereal Disease, p. 111.

undergone a slight alteration of structure. It is obvious that the term "mixed case," if it be taken literally, gives a very vague idea of this class of the complaint. Perhaps the term Inflammatory Stricture would have led to less confusion, as indicating the most usual condition of the urethra in this disease, and also leading to the mode of treatment most applicable in these cases. The "mixed case," or, as I have called it, inflammatory, may be considered as the first stage towards a permanent stricture. In inflammatory stricture the part is swollen, its vessels enlarged; and, very possibly, at the same time there may be a partial change of structure, and thus the caliber of the urethra is diminished. In strictures of this kind it is some time before the part can return to its natural state. On the contrary, in the spasmodic, the contraction of the urethra ceases at the same time with the spasm. This, then,

seems to mark their difference ; although, in practice, it is often difficult to distinguish the one from the other.

In Permanent Strictures, the contraction has become thickened and indurated, being subjected, however, to numerous variations as to the form of disease. The contracted portion may appear, as Mr. Hunter expresses it, merely * “as if the part had been surrounded by a piece of packthread;” it may be formed only on one side of the passage ; or it may extend from one to two inches, and even farther, along the canal. The former of these, where the part appears as if it were surrounded by a piece of packthread, is the simplest form of permanent stricture. In this variety the membrane appears to be protruded forward into the canal by the parts imme-

* Hunter on Venereal Disease, p. 113.

diately beneath it having become enlarged and indurated from deposition of lymph, without the membrane itself having participated in the change of structure. In this description of stricture the contraction entirely encircles the urethra ; but there is another variety, where it exists only on one side of the passage ; and thus a duplicature of membrane, with a hardened base, juts forward into the canal. This sort of stricture exactly resembles the one that encircles the urethra, excepting that it occupies a portion, instead of the whole circumference of the passage ; and it seems to correspond with what M. Ducamp and the French surgeons term a “ bride *.”

* “ Elles sont parfois supportées par une base large, vasculaire, saillante dans l'intérieur du canal, évidemment formée par la membrane muqueuse, épaissée par des inflammations répétées.”—*Ducamp, Traité des Retentions d'Urine*, p. 13.

Bridges in the urethra, according to M. Ducamp, are usually supported by a large base, vascular, and jutting out in the canal, evidently formed by the mucous membrane, thickened from repeated inflammations. This description seems to answer to those contractions which take place on the side of the canal; and it appears to me that they are formed in the same manner as the circular stricture; but the parts around become enlarged, and the membrane is pushed, as it were, before it.

The contractions, which occupy a considerable extent of the urethra, are generally extremely irregular; and their structure approaches to that of cartilage, being indurated and tough. In these cases, which are usually of long standing, the membrane likewise partakes of the change: it is firmer and thicker than natural; and should the diseased part be so situated that it can

be pressed between the fingers, it feels as if a piece of whipcord or catgut were placed in the urethra, perfectly unyielding to the pressure. The passage, at the thickened portion, is so much obstructed, that it will scarcely admit through it the slenderest bougie. The urine can only be filtrated through it in so small a quantity, that it flows from the penis drop by drop, or in a stream not larger than a hair; and the canal, at the part, is so unequally thickened that it is rendered tortuous.

Different opinions have been entertained as to the manner in which a permanent stricture is formed. Sir Everard Home seems to think that * “a permanent stricture is that contraction of the canal which takes place in consequence of coagulable lymph being exuded between the fasciculi of mus-

* Home on Strictures, vol. iii. p. 31.

cular fibres," which have been before alluded to, "and upon the internal membrane, in different quantities, according to circumstances, and in the same proportion diminishing the passage for the urine at that part, and completely closing it," apparently without any reference to the membrane itself undergoing a modification of structure. The opinion, also, that the parts surrounding protrude it forward, without the membrane partaking of the disease, is entertained by many others; and it certainly has this appearance when the alteration is in the first stage. In recent cases, it is probable that the alteration of structure in the membrane is so slight that it cannot be perceived: in very protracted cases, however, it undoubtedly does undergo a change: it is thickened, and of a harder structure than natural; and to prove this, I have only to refer my readers to many of the preparations in the

College of Surgeons. In some of these cases, it may be observed that the membrane lining the urethra is much thicker than it ought to be, and that its natural character is quite altered: indeed, I cannot conceive, when the parts are so intimately connected as the membrane and the part it covers, how the one can be affected without the participation of the other. Mr. C. Bell, in his excellent work, dwells particularly on the long and callous stricture. He conceives * “ that the contractions of the urethra, which extend to a considerable length along the canal, are produced by more severe attacks of inflammation than those which produce common strictures;” and that “ this sort of callosity differs from the more common strictures in this—that, in consequence of the spongy body which surrounds the canal of

* Letters on Urethra, pp. 19 & 20.

the urethra often partaking of the effects of inflammation, the cells are obliterated; and what was loose, spongy, and dilatable, has become condensed and rigid." So far as the alteration of structure is concerned, I agree in this opinion; but, from the mode in which parts in general become condensed, I am inclined to think that the inflammation, though it extends to a greater length along the tube of the urethra, is not severe, but of a very chronic description; otherwise ulceration or suppuration must necessarily occur. It appears to me, that permanent contractions of the urethra are produced in the same manner as permanent contractions of other mucous canals—the œsophagus, the intestines, &c. (with the exception of schirrous contractions); that a continued chronic inflammation having existed for a considerable time in the part, its vessels are enlarged, and lymph is very gradually deposited in its intersti-



tial structure. This slowly becomes organized and condensed ; and, by its increase, the canal, in progress of time, is entirely blocked up. The membrane, therefore, and the part immediately surrounding it, are rendered more and more indurated, in proportion to the length of its continuance, till it even assumes a hardness belonging rather to cartilage than any other structure.

The causes that may be assigned for the urethra being brought into a state favourable for the production of permanent stricture, are numerous. Whatever will give rise to inflammation of any particular portion of it, whether it has a specific, or whether a spontaneous origin, will equally tend to cause an alteration of structure at the affected part. Thus, whether it be from gonorrhœa, or whether from a blow externally upon the perineum, its effects are the

same. Gonorrhœa, however, from the frequency of its occurrence, is the most common foundation of a permanent stricture ; because, being of an inflammatory character, it has a tendency to alter the structure of the canal ; for, although it appears to be entirely confined to the membrane, yet when we consider the intimate connexion subsisting between that and the part it covers, we may reasonably conclude that both are affected by the inflammation. When the first stage has subsided, it is probable that gonorrhœa leaves behind it a chronic form of inflammation, which is peculiarly favourable to that deposition of lymph and thickening of the parts which is the cause of the canal being afterwards permanently narrowed. This seems to be exemplified by the circumstances attending gleet, for it frequently happens that when this discharge has continued for a considerable time, it is kept up in consequence

of the formation of a stricture. During the time I was house-surgeon to St. Bartholomew's hospital, I had frequent opportunities of examining patients who were suffering from a gleet of one or two years standing, and all the remedies used had been ineffectual. When a bougie was passed, a stricture was usually discovered in some part of the canal.—Another cause of the formation of permanent stricture is the employment of too powerful astringent injections in the cure of gonorrhœa. These, no doubt, will stop the discharge, but they induce at the same time a chronic inflammation in some part of the urethra, which at length terminates in a permanent contraction.

Permanent strictures may also be brought on from external violence upon the perineum, and these cases are generally of the severest description, as not only is the

part immediately surrounding the canal injured, but also the whole of the part between that and the perineum. Sailors, from their liability to fall from the rigging, frequently meet with accidents, which terminate in the aggravated form of this disease.—A stone in the bladder, or lodged in the urethra, will bring on a chronic inflammation, which will also give rise to it.—Passing sand, and the too frequent indulgence in venereal pleasures, will have the same effect.—Those also who are of a sedentary habit are often the subjects of this complaint. It is probable that from the constant position of sitting, a determination of blood to the perineum may be brought on, or perhaps the urethra may be irritated from the continual pressure of the seat.—Those who have diseases of the rectum are very much disposed to strictures, and we often see it in combination with a very costive habit of body—with piles, and

with fistula. The intimate vascular connexion of the urethra with the rectum is a very probable cause of this sympathy. Other particular causes, no doubt, could be adduced, which would account for the formation of strictures in the urethra : it is useless, however, to seek for them, for inflammation being the groundwork of this disease, whatever will give rise to it in the urethra, will also give rise to a permanent contraction of that canal.

There are other diseases of the urethra besides its mere contraction. Mr. C. Bell mentions a description of case, where it is narrowed, and attended with a wasting of the spongy body surrounding it at the same time. He says*, "I have found, on dissection, from two or three inches of the canal, much diminished in capacity, and rigid ;

* Letters on the Urethra, p. 22.

and all around this part of the urethra, the spongy substance obliterated." Such a case exactly as this I acknowledge I have never met with, but I have seen one where the whole canal was in a slight degree narrowed, and certainly, from the dense and rigid state of the spongy body surrounding, it appeared as if it had been obliterated. I have no doubt, however, that this thickening and hardened state of it was produced from continued chronic inflammation.

The urethra is said to be occasionally obstructed by a kind of excrescence which Mr. Hunter termed Caruncle. The caruncle is a disease of a very rare occurrence, although the ancients, who no doubt mistook the common indurated contractions for it, considered it to be very common. There is only one specimen of it in the whole of that splendid collection of dis-

eases of the urethra in the College of Surgeons, and this being accompanied by an irregular thickening of the canal, makes it difficult to ascertain its real character. Almost all authors, however, make mention of it; and, from their account, it seems to be the same description of growth as the polypus from the mucous membrane of the nose, or the uterus. The existence of an excrescence of this nature from the urethra may be doubted. If, however, we may be permitted to reason from analogy, by comparing the diseases of the human urethra with that of other animals, its presence may be incontestibly proved by a reference to the corresponding organ of the ox. There is a preparation in the College of Surgeons, where the true polypus is growing from the urinary passage of this animal. It arises by a pedicle from the mucous membrane, having a broad and rounded extremity; being, in fact, an ex-

act resemblance of the uterine polypus; and for which, if examined in a state of separation from the part to which it is attached, it might easily be mistaken.

Another species of excrescence occasionally exists in the urethra of a fungoid growth. This also is of rare occurrence, and the only instance I have seen of it is in a preparation in the Museum of St. Bartholomew's. In this case the same kind of excrescence is attached to the mucous membrane of the bladder, which is not unfrequently affected by it. In one case, also, which has fallen under my observation, a kind of warty excrescence has been present in the urethra.

Having thus briefly enumerated the causes of permanent stricture, and those forms of disease to which the urethra is most liable, with exception of some of the

morbid changes in consequence, and the result of the obstruction, which will be better discussed hereafter, I proceed to the most usual situations of permanent stricture, their symptoms, and their consequences.

CHAP. II.

*Of the Situation of Stricture ;—its Symptoms—
and the Morbid Changes in consequence.*

STRICTURES have been known to be formed in every part of the urethra, excepting in that portion of it which is surrounded by the prostate gland. Their most usual situation, however, appears to be where the canal is narrowest. Thus they are most frequently met with at the entrance into the membranous portion, immediately behind the bulb, in the membranous portion itself, and about four inches and a half from the orifice. These, according to measurement, are the most confined parts of the urethra, and it is probable that they are more liable to become strictured on account of their being ex-

posed to the stream of urine, from their protusion into the canal. In the same manner we find strictures of the œsophagus to occur where the funnel of the pharynx narrows into the gullet; strictures of the cardia, where the passage is straightened by the muscular fibres of the diaphragm; again, at the pylorus, where the bag of the stomach contracts into the duodenum; and lastly, in the rectum, where the sigmoid flexure turns over the ridge of the sacrum. At these different points the canal receives the impulse of the contents as they pass, and if predisposed, are excited to inflammation, ending in thickening and stricture. In a similar manner in the urethra, the more contracted parts receive the momentum of the stream of urine, and if predisposed, become inflamed, and when once inflamed, the same causes continue to keep up that state, and to aggravate the affected part. This I am inclined to think is the

cause why strictures more frequently occur at particular points. But there are other situations, also, where it is not uncommon for strictures to exist—the orifice itself is often contracted, and the part three inches and a half distant from it. Mr. Hunter considered that the bulb itself was most liable to the attack: I am inclined, however, to agree with Mr. Macilwain, that the affection most commonly occurs immediately behind it; and this I am led to infer, both from experience, and also from comparing together the specimens preserved in our museums.

As there are various alterations in the structure of the part during the formation of stricture, so are there various symptoms corresponding with these changes. In the first stage of stricture, the part is only affected by slight chronic inflammation; hence all that the patient feels is an irrita-

tion in the urethra, with a sense of a burning pain as the urine flows through that portion. This occasions him but small inconvenience, and he takes but little notice of it; but, as the disease advances, the stream of urine, from the diminished caliber of the canal, becomes lessened in size, its course forked, or in some manner misshapen. During this stage of the disease, the symptoms alter their character in a ratio with the state of the diseased part. If there be but little inflammation, and the stream of urine be only slightly diminished in volume, the patient is often unconscious of an obstruction in the passage; for the bladder, being obliged to increase its action from the sudden stoppage of the urine, has gained a greater degree of muscular power, and thus the urine is impelled from it with greater force, which prevents him from observing the lessened stream. If, however, on the other hand, there should

be much disposition to inflammation at the strictured portion, the least variation from the usual mode of living, the drinking much wine or spirits, the sudden change of atmosphere, the taking more exercise than ordinary, the catching a cold, or the slightest derangement of health, will immediately give rise to new symptoms. Under these circumstances there may be excessive pain,—there may be an extreme degree of spasm in the urethra, so that the urine may be at first prevented from passing, and then suddenly gush forwards ; or there may be total retention. A bougie passed at this time will very probably be arrested by spasm before it arrives at the stricture ; and when its point touches the inflamed and contracted part, the patient will immediately, and involuntarily, grasp the hand of the operator. The pain felt is extremely acute ; and when the bougie is withdrawn, it is found charged

with mucus, and very frequently blood follows its removal. Those who are afflicted with strictures are occasionally attacked by shooting pains in the perineum; they often are subject to nocturnal emissions;—a constant discharge, like gleet, with an occasional attack, resembling gonorrhœa, and a constant desire to make water. Sometimes they have a fluttering sensation at the strictured part: sometimes a cluster of vesicles, which have been called “*Herpes præputialis*,” followed by ulcers, will make their appearance upon the glans penis, without any apparent cause; just as vesicles and ulcerations break out about the mouth, indicating an irritable and inflamed state of the mucous membrane of the alimentary canal: and sometimes great irritation may subsist at the orifice of the urethra.

All these are common indications of

stricture ; and, in each individual, a greater or less number of them may be present. But there are other symptoms which are dependant upon the contraction. The semen is very often prevented from making its exit at the time of coition. This is extremely distressing, and arises in consequence of the urethra having the power of contraction at the time of its emission. During the performance of this function the whole canal is lessened in diameter ; and the strictured part not having entirely lost this power, becomes completely closed, and thus the semen is prevented from passing through it. When this is the case, the semen is thrown backwards towards the bladder, and makes its exit some time afterwards. At the period of coition, under these circumstances, an extreme darting pain is felt, and it has been asserted that bleeding from the urethra takes place, in consequence of the rupture of

some of the small vessels.—A swelled testicle is often concomitant with stricture. The urethra and the testicles sympathize with one another; hence, when the former is inflamed, the latter often becomes inflamed also. This may be observed in gonorrhœa. If the inflammation increase in this disease, and the discharge ceases, hernia humeralis very frequently arises in consequence. So likewise, in stricture of the urethra, it is a very common circumstance that swelled testicle arises from the irritation produced in this canal, the one sympathising with the other. A patient has frequent attacks of swelled testicle, being unable to assign any cause for it. He consults his surgeon, who treats him according to the usual methods: the swelling subsides for a time, but in a short period it returns again. At length, this having repeatedly occurred, a bougie is passed, and a stricture is commonly discovered to be present in the

membranous portion. Such cases as these have frequently happened in my own practice; and whenever a patient is liable to these attacks, I usually suspect a stricture is the cause of it. Those, also, who are the subjects of stricture, very frequently have attacks of rigor resembling ague. The patient is attacked by the cold, the hot, and the sweating stage, one succeeding the other, as in this complaint. It chiefly occurs when the urethra has been irritated from any particular cause: thus, if a bougie be passed, or the patient has committed any excess, it is succeeded by this affection.

When the stricture has become indurated, and the contraction very small, all the symptoms just related may be present, but they are usually more decided. In this stage of the disease the urine can only dribble away from the penis, or flow drop by

drop. The patient, at this period of the complaint, suffers great pain, and is generally at least half an hour in voiding the contents of his bladder. He is obliged to sit upon the chamber-pot, to press upon the perineum with his fingers, to grasp the penis at its extremity, or to employ some other manœuvre equally harassing. In some cases the urine flows from the patient involuntarily, and thus he is always wet and offensive to those around him ; or he has a constant desire to make water. A poor man, whom I was attending some time back, and for whom I divided the stricture with the armed catheter, assured me that he had not slept longer than two hours together for two years. He said, that hardly an hour, or even half an hour, elapsed without his feeling this inclination, and that he was obliged to rise immediately from his bed to relieve himself. His health had much declined, and he was reduced to that degree

of emaciation, that he almost resembled the *Anatomie vivante*. His bodily powers had so greatly diminished that he was obliged to give up his employment: indeed, he was in such a state of mind that he would have hailed death with delight. This case was one particularly gratifying to me; for, on the first night after the division of the stricture, he slept four hours without intermission. From this time he continued to improve; and in the short space of a month he became so fat as not to be like the same man. This case is not singular. It may be observed, that there are others where equal relief was experienced from the method employed, related at the end of this treatise.

In the last stage of stricture, various other symptoms have arisen in consequence of the obstruction. It is probable that the patient has had one or more attacks of

retention of urine, or that the urethra has ulcerated immediately behind the stricture, and thus the urine has been extravasated into the surrounding cellular substance. In the former of these two, the patient suffers great pain,—and he has a constant desire to void his urine, without the power of accomplishing it. As the bladder fills, the pain becomes excruciating ; till at length, unless the patient is relieved by the stricture yielding to the treatment adopted, or by puncturing the bladder, it mortifies, or ulcerates in some part of it, and bursts. In the latter case, when the urethra ulcerates behind the stricture, the urine being infiltrated into the surrounding cellular substance, a tumor is formed in the perineum, or in the neighbouring parts. This gradually increases in size ; and, unless it breaks, or is opened, it causes the most appalling symptoms. The patient suffers extreme pain ; a low fever, somewhat resembling

typhus, is brought on; he becomes comatose, and in this state dies. If, however, neither of these circumstances—retention of urine, and ulceration of the urethra—have occurred, the long continuance of the obstruction will materially affect the general health. The patient becomes emaciated, nervous, and feeble;—his spirits desert him, his intellect is impaired, and his countenance puts on an anxious and ghastly appearance. He is affected by a paralytic tremor, he is seized with a drowsiness amounting almost to stupor, and is indifferent to all around. At length, being exhausted, he sinks, and falls a victim to the disease.

The morbid changes which the urinary organs undergo from the obstruction in the canal of the urethra, are numerous. First, that part of the urethra immediately behind the stricture is dilated to a

greater or less extent, according to the length of time the stricture has been present. Secondly, the urethra is generally more or less inflamed between the stricture and the bladder; it ulcerates, and the urine makes its escape. Thirdly, the bladder becomes thickened, the prostate gland diseased, and the kidneys and ureters participate in the mischief.—The dilatation of the urethra arises in consequence of the flow of urine being arrested in its progress; and thus, from the sudden stoppage, the part immediately behind becomes distended. The urethra then inflames and ulcerates, and the urine is infiltrated into some of the neighbouring parts; and thus urinous abscesses and fistulous passages are formed. The former of these usually contain an extremely foetid, urinous, sloughy matter; and through the latter the water makes its exit; and they usually lead immediately from the urethra to the perineum; but they

sometimes terminate on the side of the rectum, anterior to the scrotum, at the scrotum itself; and, in some few instances, I have known a fistulous passage to extend from the urinary passage to the back part of the thigh. By these fistulous passages the urine, at the time of micturition, makes its escape, instead of through its natural channel; and, when they have continued for a long time, their sides become hardened; and, in some instances, they are lined by a kind of membrane. Specimens of this description are to be seen in the College of Surgeons. In one case there are two fistulous passages, which resemble regular mucous canals, being lined by a membrane analogous to the mucous tissue.—It is a curious fact, that if a false passage be made, leading from one part of the urethra to another, and the urine passes through this new channel, it is also found to be lined by a

membrane, or what looks like a membrane, and it has the appearance of a natural-formed canal. This I have seen in one or two instances; and my friend, Mr. Lawrence, mentioned to me a case where he found, in the urethra of a gentleman who had been in the habit of having bougies passed, a new canal formed, of between two and three inches in length, commencing anterior to the bulb, running close along the side of the natural canal, and terminating in the prostatic portion. This canal had a smooth mucous surface, very similar to the urethra itself. In a case, also, which occurred to myself, the urethra, in that portion of it which passes through the penis, was impervious; but immediately under it there was a newly-formed passage, which, likewise, was lined by a membrane of the same description.

The morbid changes that are observed in

the bladder, when a patient dies of stricture, are, that the muscular coat is extremely thickened, and that the mucous membrane of that organ is often considerably ulcerated. The pillars of the muscular fasciculi are frequently so greatly enlarged, that the internal surface of the bladder has a columnar appearance, somewhat similar to the ventricles of the heart; and the mucous membrane is sometimes protruded between them, by which pouches are formed. The ureters are also much thickened and distended; and, in some cases, they have been enlarged to that degree that they have resembled a piece of small intestine. The pelvis of the kidney is likewise increased in size, being sometimes dilated to a great extent. The prostate gland is frequently enlarged; abscesses are occasionally found in it, with fistulous passages leading from them to the perineum or parts around, and its natural ducts are often considerably dilated.

CHAP. III.

*Treatment of Spasmodic and Inflammatory
Stricture.*

DURING the formation of a stricture in the urethra, the state of the diseased part varies, according to the progress it has made towards that change of structure which renders it permanent; as, in the first stage, only an irritability exists, attended, when there is any exciting cause, by spasm; in the second, inflammation and spasm; in the third, an alteration of structure, accompanied with, or without inflammation and spasm; and in the last, the part has become nearly, or quite, impermeable, and of a cartilaginous texture; so the treatment of stricture will be regulated by the state of the diseased part.

If there be little or much inflammation, or that the structure of the part has become altered, means adapted to each of these several states ought to be employed. This view of the question, however, appears to have been too generally lost sight of; and the treatment, as regards the cause of the disease, too much neglected. Stricture of the urethra has been, and still is, considered by many surgeons (at least if we are to judge by their practice) as a mere mechanical obstruction, without the least reference to it as a disease produced by inflammation. If, therefore, a bougie can be passed through the stricture, of whatever character it may be, it is sufficient,—no farther treatment is considered necessary. By taking a review, however, of the mode by which a stricture is formed, and of the nature of the disease, we shall find that other means can be employed,—such as local blood-letting, soothing the

diseased parts, and attention to the general health.

I shall begin to speak of the treatment of stricture in its first stages ; that is, while it may be deemed spasmodic and inflammatory ; and afterwards I shall devote a chapter to those which have undergone a change of structure.

From what has been considered as the predisposing and local causes of spasmodic stricture, and from its existing only during the continuance of those causes, the cure will obviously depend upon, and be accomplished by, their removal. If the spasmodic stricture depend upon the extreme irritability of the urethra, occasioned by a morbid irritability of the stomach, and produced by some irritating cause present in that organ, it will be our care to remove such offending matter, or neutralize its

effects ; or we may directly allay the tendency to spasm by opium, camphor, and other anti-spasmodics ; or by soothing the affected part with fomentations, &c. We must, however, bear in mind in this case, that we are only overcoming the tendency to spasm for a time, and not removing the cause. The cure must be effected by diminishing the general irritability. If it arise from a local cause, as the urine being of too stimulating a quality, the tendency to stricture will be diminished by diluting largely with mucilaginous drinks. The same end is also attained by neutralizing the urinary salts with alkalies. Attention, likewise, should be paid to the food eaten, taking care that it is not of a stimulating or irritating nature ; and such medicines should be administered as will assist the digestive powers, and regulate the excretions. Whenever the voiding of the urine is attended by much pain, together with spasm,

and a diminution of the size of the stream of urine at the same time, we may be assured that one or other part of the canal is more or less inflamed. Under these circumstances it is adviseable that leeches be applied to the perineum, that the bowels be freely evacuated, and that the patient be placed in the warm bath, or desired, according as the symptoms may require, constantly to foment the perineum. As long as these symptoms continue, the above remedies should be repeated at least twice in the week, and if they are urgent, even oftener. When the pain and irritation of the urethra have subsided, then, and not till then, a bougie may be passed to ascertain the state of the canal. If the bougie passes readily through the contraction, without spasm or pain, we may be certain that the inflammation is nearly subdued: if, however, on the contrary, it is entirely resisted by spasm, or its intro-

duction is attended by great pain, but little abatement of it can have taken place. In the latter case leeches must be again applied to the perineum, the warm bath and fomentations continued, and the bowels kept freely open. In the former it may be as well to apply leeches also, after the introduction of the bougie ; but this must be regulated by the symptoms during its passage.

In all difficult cases of stricture it is adviseable to prepare for passing the bougie by the application of leeches, and fomenting the perineum immediately before its introduction. By pursuing this method, the vessels of the part are emptied, the inflammation reduced, and the urethra is rendered less irritable. This plan of treatment I have frequently adopted ; and I have succeeded in many cases where I am convinced I otherwise could not have

passed it. When, also, the bougie has been resisted by spasm, or that there has been much pain and irritation during its passage, I have directed that leeches be applied immediately afterwards, with a view of preventing the inflammation which might otherwise have arisen.

Opiates, both administered internally, and used as a suppository, are very beneficial in allaying pain and irritation of the urethra. The best method of employing them internally is, by keeping the patient under their influence; that is, by giving small and repeated doses at stated intervals. The extract *conii*, and the extract *hyosciami*, appear to answer this purpose better than any narcotic, inasmuch as they do not produce the same feverish disturbance in the system as is occasioned by opium, nor give rise to the same disposition to constipation. I generally combine

them with the dried subcarbonate of soda, beginning with five-grain doses every six hours, and increasing the dose according to the effect produced. When a suppository is necessary, the pil. sapon. c. opio is perhaps as good as any that can be employed. From twenty to forty grains, or even more of this, as the symptoms require, may be placed in the rectum, when extreme pain and irritation are felt, or every night at bed-time. An enema, also, containing tinct. opii in the same proportion, is another mode of employing it; and this, in severe cases, may be better than the other, as it acts also as a fomentation to that part of the urethra which is in contact with the rectum, and empties the contents of the bowel at the same time.

The diet is another very important consideration in the treatment of inflammatory stricture. This should be of the mildest

description ; for any thing taken into the stomach of an irritating nature, would naturally affect the secretion of the kidney, and also produce a disposition to inflammation generally. The urethra, therefore, being already diseased and inflamed, both these causes would tend to increase it. This is exemplified by a patient with stricture drinking spirits or wine too plentifully ;—the part immediately becomes inflamed, and sometimes to that degree that retention of urine is the consequence. The diet should be regulated by the state of the stricture. If the patient is suffering great pain, irritation, or difficulty in voiding his urine, it ought to consist of vegetables, puddings, maccaroni, &c. : if, however, these symptoms are absent, he may take a proper proportion of meat, with vegetables, never overloading the stomach, and always avoiding spirits and fermented liquors. Added to these precautions in diet, the bowels should

be regulated by mild aperients, and an alterative pill (pil. hyd. sub. c. gr. v.) taken on the alternate nights.—In all cases of stricture, also, in whatever stage of the disease, a tepid fomentation applied to the perineum will be found extremely soothing and beneficial in allaying the pain and irritation of the canal; and it ought always to be made use of three or four times in the day.

Nothing, reasoning *à priori*, can appear more injudicious than passing a bougie through an inflamed and irritable canal. It would incline one to believe, instead of its producing any good effect, that it would increase the inflammation and irritability of the urethra. This, however, is not the case, at least when the inflammation is not very severe: on the contrary, when there is not a *high* degree of it, it is beneficial. First, it enlarges the part; and thus, there

being less obstruction, the urine passing through it does not cause so much irritation ; and secondly, the bougie, touching the surface of the tender membrane, accustoms the part to the stimulus of a foreign body, and thus renders it less irritable. It is not at all an uncommon occurrence, that, on the first introduction of a bougie, the patient feels as if a hot iron were passing through the urethra ; and he expresses the sensation exactly in such terms : on the second introduction he has less sensibility in the canal, on the third still less, and at length none at all. It is remarkable, and hardly to be accounted for, but the very touching the strictured portion, without passing the bougie through it, will sometimes give relief. This I have observed in many cases, and in some few instances where retention of urine has existed.—A patient who was under my care during the period I was house-surgeon

at St. Bartholomew's, used to be frequently attacked with retention of urine from stricture; the moment the catheter touched the contracted portion the spasm ceased, and the urine began to flow. In a case which Mr. C. Bell mentions, there was a false passage on the side of the stricture, and even passing a bougie into this false passage relieved the patient.

A question may be asked, how often ought a bougie to be passed? In answering this, some would say, once in the week, others twice, and others, on the alternate days. The passage of the bougie should, however, be regulated by the state of the diseased part. If there is a *high* degree of inflammation, the bougie ought not to be passed at all until this is reduced. If it is not very violent, once in the week will be sufficient; and if it is but slight, it may be done twice to advantage; but it never

should be introduced oftener. At first it would be better to employ the common wax or gum-elastic bougie, as neither of these is likely to injure the urethra. Afterwards, however, I prefer the metallic bougie, or rather the silver catheter, having observed that the cure of stricture by these instruments is more permanent: they resist spasm, and you have more command over them. At the same time, having a polished surface, they pass more easily; and if a catheter be used, you know when you have entered the bladder, from the flow of urine through it.

Retention of urine is a very common consequence of stricture; and, in this case, there are different opinions as to the treatment that ought to be pursued. Some advise that the catheter be not passed until the inflammation is reduced, while others recommend that its introduction be at-

tempted. In very urgent cases, and where the patient is suffering extreme pain from the distention of the bladder, I am inclined to favour the latter. It is some time before the inflammation and spasm of the stricture can be reduced; and during this period the patient is suffering increased pain, and the bladder is becoming larger and larger. If, under such circumstances, a catheter could be by chance (for in such a case it can be considered as no other) passed, the advantages gained would be so great that it would more than counterbalance the increased irritation that might ensue from its introduction. The means for the reduction of the inflammation might at the same time be pursued, so that no time would be lost, and the catheter also be used with so little force, that trifling injury could be done to the inflamed part. In more moderate attacks of retention of urine, I should prefer, however, that the inflammation be, if pos-

sible, reduced before there is any attempt made to permeate the stricture. It is almost unnecessary to enumerate the methods by which this is accomplished: I will, however, briefly state them.

The patient should be bled to syncope; he should be placed in the warm bath, leeches should be applied to the perineum, a powerful opiate enema injected into the rectum, tartarised antimony given so as to produce nausea; and he should constantly foment the perineum. These means should be repeated, if necessary; and if they fail, an attempt should be made to introduce the catheter. When this instrument cannot be passed, the distressing alternative of puncturing the bladder must be had recourse to, or the lancetted stillette used, as will presently be described. I have observed, in many cases of retention of urine, that the opiate injection, administered im-

mediately after the patient is taken out of the bath, has been attended with good effect. It is probable that the warm fluid, being immediately in contact with the posterior surface of the bladder, and that part of the urethra adjoining the rectum, soothes those parts, as well as the muscles around the canal, diminishing the tendency to spasm, and completing the relaxing effect of the bath; while, at the same time, the opiate acts as an anti-spasmodic. The muriated tincture of iron, given in doses of twenty to thirty drops every ten minutes, or quarter of an hour, will, in some cases, relieve the spasm, and cause the urine to flow.

When there is a difficulty in passing an instrument, a small gum elastic and highly-varnished catheter, with the curved wire in it, may be tried. As this approaches the stricture, the wire should be partially withdrawn. By doing this, its point will

be rendered pliable, and it can be kept against the upper surface of the urethra, where generally the stricture affords less resistance. The catheter without the wire will occasionally pass better than with it, and sometimes a common small soft bougie will permeate the stricture, when it cannot be effected by any other instrument. Each may in its turn be tried, taking care, however, at the same time, not to injure the urethra, by employing them with too great a force.—If the point of the catheter or bougie be passed along the lower surface of this canal, it will not enter the stricture, and the reason of this is, as it appears to me, that the urethra having nothing to support it beneath, yields to the pressure of the bougie, and thus forms a pouch immediately anterior to the stricture in which its point lodges. This seems to explain why success attends the introduction of a bougie or catheter,

when its point is made to press upon the upper, and not, as is imagined by some, that the stricture is more perceptible on the lower surface of the passage. In some cases a catgut bougie will pass when no other can be made to permeate the stricture, and it is probable, that this is owing to its peculiar pliability, and to the resistance it affords at the same time. As the catgut bougie cannot be made to resemble the curve of the urethra without its losing its resistile power, it should be slightly bent at its point, so that it may press against the upper surface of the canal.

Before passing the bougie, it should be bent as nearly as possible to the curve of the urethra; and the penis should be elongated, to prevent folds, in which its point may lodge, being formed in the canal. On its first introduction, the bougie should be nearly as large as

the caliber of the urethra, as small ones are apt to be caught in the lacunæ as they pass, and thus we are prevented from ascertaining the exact state of the stricture. Its introduction, also, should be effected with the greatest care and gentleness; and if, when it arrives at the stricture it is resisted by spasm, a steady and continued pressure will sometimes overcome it, but force never should be employed. When the stricture will only admit through it a very slender bougie, it is a good plan to pass a silver tube down to it first, and then to introduce the bougie through this canula. By pursuing this method the bougie does not catch in the lacunæ, and it is not softened from the warmth and moisture of the urethra.

When a stricture is in that tranquil state that it will admit through it a bougie or catheter without much pain and irritation,

the size of the dilator should be increased every or every other time it is introduced, until it arrives at No. 12, 13, or 14, according to the natural diameter of the urethra, which varies in different individuals. It should be passed, as before stated, once or twice in the week ; and when arrived to the *maximum* size, its introduction should be continued for a few weeks, to ensure the permanency of the cure : indeed, from the liability of the return of stricture, I am almost inclined to recommend, that it be passed once in three months, for a year or two afterwards. This would prevent the recurrence of the disease, and, in time, would become habitual.

The first introduction of a bougie produces, in different individuals, various effects. Sometimes the patient is immediately seized with a fainting fit, sometimes with sickness, and at other times an extreme cutting pain is felt in the urethra. In some

cases, also, the passing of the bougie almost always causes so much irritation, that when the patient is predisposed to it, an attack of rigor is the result. When we have reason to suppose that this affection is likely to occur, we should employ every means in our power to prevent it. It arises from irritation of the urethra, and therefore our chief endeavour should be to remove the cause of this irritation. This I have found to be best effected by the application of leeches to the perineum, immediately after the introduction of the bougie; by constantly fomenting the part; and by employing an opiate suppository or enema. An opiate draught may also be given with good effect. This plan of treatment I have adopted in several cases, and in one gentleman, who had given up all hopes of his stricture being cured, on account of his always being thus attacked after the passing of a bougie, these remedies completely prevented it, and he is now recovered.

CHAP. IV.

Of the Treatment of Permanent Stricture.

HAVING thus briefly treated of the cure of the simplest forms of stricture, it remains for me to speak of the last and more complicated kind,—the Permanent. We have here to contend with a modification of structure of the urethra ;—with a part irregularly thickened, and so indurated as to resemble the structure of cartilage ;—and with a narrow canal, contracted to that degree, and so extensively, that it is either quite impermeable, or it will only admit through it the smallest-sized bougie.—To effect a cure of these states of the urethra, we have to enlarge the contracted passage ;—to procure the absorption or destruction of the surrounding thickened tissue ;—and to

restore the parts to their healthy condition.

The different plans which have been adopted to permeate this description of stricture, and to restore the urethra to its healthy condition, are four in number:—First, it has been attempted to make the part ulcerate by the continued pressure of a bougie upon it. Secondly, some surgeons have endeavoured to force through the contraction with a conical sound. Thirdly, caustics have been applied to the diseased part with the view of destroying it. And, fourthly, the part has been divided from the perineum. The two former of these plans of treatment,—the endeavouring to make the part ulcerate, and the forcing through the contraction with a conical sound, are now, from the danger and uncertainty with which they are attended, totally relinquished ; and the two latter, —

the applying caustic, and the division of the stricture from the perineum, are the only means which are at present practised. These, however, are also attended with great risk. The destruction of a permanent stricture by the application of caustic, is an extremely tedious and painful process, uncertain as to its final result; and, at the same time, as will presently be shewn, symptoms frequently arise that endanger the life of the patient. The division of the stricture from the perineum is a very difficult and painful operation: it is often unsuccessful; and also, it is so little susceptible of being reduced to fixed rules, that it can hardly become a measure of general adoption.

With regard to the treatment of stricture by caustic, we find from Sir Everard Home, and others who have written on the subject, that it is often attended by extremely

dangerous consequences. These consequences are, great pain, retention of urine, profuse hæmorrhage, false passages, violent inflammation, rigors, fever, stranguary, and swellings in the perineum. That these are the symptoms which frequently occur from strictures being treated after this method is acknowledged by Sir E. Home himself, and all those who have employed it. Sir Everard expressly states*, “that the pain that is brought on by caustic lasts for some time after it is withdrawn;” that “it is sometimes not felt at the time, but that it comes on a few minutes after the caustic is removed, is very severe, and lasts for hours;” and that “the surgeon who makes the application is made conscious of it by the smaller arteries of the part beating with unusual violence; which is very distinctly felt by the finger

* Home on Stricture, Vol. I. sect. 7.

and thumb which grasp the penis." Sir E. goes on to state, that another effect of the application of the lunar caustic "is, in some particular cases, very profuse hæmorrhage;" and he relates six cases of this description, in all of which it was so considerable that the patients were extremely lowered by the loss of blood; and some of them bled so profusely, that the quantity lost amounted to two or three pints. Retention of urine is often enumerated, by the same author, as following the use of caustic; and, in four cases where it occurred from its application, the bladder was punctured, in two instances of which the patients died. Lastly, not to mention the instances where constitutional symptoms, rigor, &c. arose, the formation of false passages has been admitted, by all who have written on the subject, to be a consequence to which the use of caustic is extremely liable; and the experience of

every surgeon will supply him with many examples of their occurrence being the result of this treatment. These are the principal objections to the application of caustic ; and, in addition to them, the number of times necessary to repeat its application, is another of no small importance. It may be observed, that it is not an uncommon circumstance, that a stricture is touched with it six, eight, ten, twenty, thirty, sixty, one hundred, and even more times ; and at each application one or other of the above alarming symptoms may occur. The time, also, that it takes to effect a cure when it does succeed, is usually months ; and, in many cases, it has been even years.

Another description of caustic, the potassa fusa, which, if it be applied immediately to the flesh, before it liquifies, is more powerful than lunar caustic, has been recommended by Mr. Whately. He sup-

posed the potassa fusa destroyed the diseased portion much more quickly, and effected a more permanent cure than lunar caustic. These advantages, supposing them to exist, are more than counterbalanced by the difficulty of transmitting the potassa fusa down to the stricture without liquifaction, and the possibility of confining its action to any determined point. In other respects it is liable to the same objections as the lunar caustic. It requires repeated applications, gives great pain; and the same symptoms, hæmorrhage, retention of urine, &c. may arise from its employment.

Having thus pointed out the difficulty and danger of dividing strictures from the perineum, and the uncertainty and alarming consequences attendant upon the treatment by caustic, I have now to propose another method of treating this

disease in its more aggravated and obstinate form.—It is the division of the diseased part within the canal of the urethra.—The advantages of this mode of treatment are, that it effects with certainty, and in a short time, what the caustic is intended to accomplish by repeated and tedious applications ; and it is free from the difficulties of the operation for the incision of the stricture (an operation little less painful than that for lithotomy) through the perineum, thereby saving the patient the inconvenience and misery of a new channel, leaving but little for nature to repair ; and at the same time allowing the urine to flow through its natural passage. For this purpose I have invented two instruments, the one to divide Permanent Strictures, while yet a small bougie or wire can be passed through them ; and the other to divide those strictures which are impermeable.

The instrument * for operating on permeable strictures (which, for sake of distinction, I have called the Double Lancetted Stilette,) consists of a round silver graduated sheath, open at both ends, of the size of No. 10 catheter, with rather a less curve, and of a Stilette, which is also hollow, and open at both ends. This stilette is furnished, at one end of it, with two oblong lancets; and at the other with a handle, resembling a button. When the instrument is complete, the stilette fits into the sheath, so that by pushing the handle, the lancets will project from the extremity of the tube, and by drawing it back they will retire into it again. When used (the mode of doing which will be presently explained), the instrument is passed over a wire down to

* *Vide* Plate and Description.

the stricture, and the lancets are thrust forward on each side of it, by which the contraction is made as large as the natural size of the urethra*. The armed stilette, intended to divide impermeable strictures, exactly resembles the one just described, excepting that, instead of the stilette being hollow it is solid, and in the place of two there is only one lancet.

Before using the instruments, the exact distance of the stricture from the extremity of the urethra should be ascertained. In the armed catheter, which is intended to divide strictures over the wire, which serves as a guide, the wire must be introduced

* This handle has hitherto been formed like a button; but I have thought it would be of advantage to have it made like two rings, large enough to admit the finger and thumb, similar to the handle of a pair of scissors.

through the stricture first. The mode of accomplishing this is, by passing the smallest possible-sized catheter, made to contain the wire, into the bladder. The wire, which is double the length of the catheter, and blunted at one end, so that it may not injure the bladder, is then pushed forward, and the catheter gradually withdrawn, by which the former is left in the canal of the urethra. The armed catheter is then passed over the wire, until its point rests against the stricture (which is known by means of the graduation), and being held securely in such position, the handle of the stilette is pressed gently and gradually. As soon as any impression is made, the lancets should be allowed to retire into their sheaths, and the blunt point of the instrument urged forward. If it do not pass on, the lancets may be again used as before. After the stricture is divided, the armed catheter should be withdrawn, and its place sup-

plied by one of elastic gum of the same size. This should remain for a day or two, to prevent the re-union of the divided parts, and to preclude the possibility of extravasation of urine ; and, on its removal, a bougie should be passed twice in the week, or as often as may be judged necessary, for some time ; and the same treatment adopted as for stricture in general. The armed stilette, intended to divide impermeable strictures, must be used precisely in the same manner as the other, of course excepting the wire, which cannot be introduced ; and the same directions for the after treatment are necessary for both.

In some of the cases in which the instrument has been employed, the division of the stricture has been followed by more or less inflammation, but seldom amounting to a great extent. Such an occurrence should be guarded against by the application of

leeches to the perineum immediately after the operation, and by a strict adherence to the antiphlogistic regimen. If the presence of the catheter that is left in the urethra cause considerable pain, it must be withdrawn; but, in this case, it is of material consequence to pass a bougie daily, lest the divided parts re-unite.

It may be objected to the use of these instruments, that there is a liability of making by them a false passage. This is prevented, in the permeable stricture, by the wire acting as a director, and limiting the incisions to the size of the natural canal, so that it is impossible to deviate from the course of the urethra. With regard to the second case, or when the stricture is not permeable, it must be admitted that, in unskilful hands, or by violent means, a false passage may be formed; but that, with common care, this is not likely to

occur, is proved by the result of not less than twelve cases of impermeable stricture, where I myself have used the armed stilette, or have seen it employed. In no case was there any false passage made. I very much question, however, if the same number of cases had been treated by caustic, whether they would have been attended by the same success. On the whole, therefore, it may be safely inferred, that although it is possible that a false passage may be made by the single lancetted stilette, yet, with common care, it may be avoided.—It might, perhaps, also be thought that considerable hæmorrhage would follow the division of the stricture by these instruments, and that they would produce much pain ; but, in the cases in which it has been employed, the bleeding has been inconsiderable, and the pain trifling.

In cases where strictures have existed for ten or twenty years, and upwards, on which I have operated, it appears that the hardened structure by which the contraction was formed, became completely absorbed ; and that the urethra, at the part, was restored, apparently, to its healthy condition. In no instance, where the stricture has been divided, have I had an opportunity of examining the part ; but, if I may be allowed to reason from passing the catheter or bougie at different periods after the operation (in some of them more than a year), I may fairly come to the above conclusion. In none of these was there left the slightest hardness at the diseased part : indeed, in many of the patients, it would have been difficult to have said where the contraction had been present. It is probable that the division of the thickened and indurated substance produces ulceration of the diseased structure, at least where

the incision of the part takes place, and that in this manner it is destroyed. This I am led to infer, from having observed that, in some cases, if the stricture be only punctured, without being completely divided, that on the following day a catheter can be passed. This circumstance happened in one or two cases where Mr. Earle employed the instrument for impermeable strictures; and in these there was a slight discharge of pus from the urethra before a catheter was passed, which seems to prove this fact. This may not, however, be the only reason why the thickening and induration disappear from its division: it may be accounted for, perhaps, on another principle. It is reasonable to conclude that when a canal, which is naturally open, has become straightened at one particular point of it, that by relieving this straightened part, great irritation must necessarily be removed, consequently, the

lymph which had been deposited between the interstices of the contracted portion, and which had materially assisted to form the induration, may possibly become absorbed, and thus the part be nearly restored to its natural character. What seems more particularly to illustrate this point is, that sometimes the orifice of the urethra becomes nearly closed, and excessively indurated. In a few cases, where I have divided this description of contraction, I have found the hardness entirely to subside. The incised part has ulcerated, and secreted pus; but the dense structure all around it has gradually become softened, until it has totally disappeared. It is not only in the urethra that I have remarked that the division of an indurated structure will cause its absorption.—In one instance, where Mr. Lawrence operated for the stone, there was an extremely enlarged and hardened prostate gland (so

hard that it resembled the structure of gristle); and this, some time after the operation, became of its natural size and structure. In a case, also, where Mr. Titus Berry divided a hardened contraction of the œsophagus with the armed stilette, the part was restored to its natural character. It is almost impossible to say, for certain, by what process this is effected: it is, nevertheless, a very valuable fact, and one which is well worthy the notice of the profession.

The cases in which the armed stilette appears likely to be most beneficial, are those where the contraction is so hardened, and of so unyielding a nature, that it will not admit of being dilated at all; or where, as Mr. Hunter expresses it *, “it is seldom or ever more than a temporary cure; for,

* Hunter on Venereal Disease, p. 117.

although the passage may be dilated sufficiently for the urine to pass, yet there is always the original tendency to contraction, which generally recurs sooner or later." In these cases the division of the diseased part would be of great advantage; for, by one incision of the armed stilette, the contracted portion would be made as large as the rest of the canal; and, at the same time (at least judging from the cases where strictures of this description have been already divided by this instrument), the induration would completely disappear in the course of a month or six weeks, or even less time, and the stricture would be permanently cured. Most of the cases where Sir E. Home employed the caustic, and where the distressing symptoms before alluded to occurred, resembled the above. Surely it would be far preferable to divide the stricture at once, than to employ a remedy so tedious, uncertain, and dangerous

in its consequences. In cases of partial and total retention of urine, the armed stilette would be found particularly serviceable. It occasionally happens, that after repeated attempts to pass a very fine gum-elastic catheter in these cases; we at length succeed. How very advantageous would it be, if, under these circumstances, the contracted part was enlarged; for if the catheter should be withdrawn, it is very doubtful whether we should be ever able to repass it. Such cases as these are not uncommon; every experienced surgeon must have frequently met with them; and, during the time I was pursuing my studies at St. Bartholomew's, I recollect several. In many cases of old and indurated strictures, and where but little can be done for their relief, those afflicted with them have, upon the slightest accession of inflammation, an attack of retention of urine; and sometimes a very small catheter, at this period,

can be passed for them, and sometimes not. When the catheter can be introduced, the double-lancetted stilette would immediately, and without danger, accomplish the division of the contraction, freeing at once both the patient's and surgeon's mind of the possibility of the recurrence of retention of urine, and it would, at the same time, cure the stricture ; and when it could not be passed at the time, the inflammation might be reduced, and the contracted part be divided afterwards. In all those cases, also, where there has been extreme difficulty in passing a bougie or catheter, the double-lancetted stilette would at once relieve them.

By dividing a permanent stricture we are only enlarging a contracted canal to its natural size, and thus relieving the system of the irritation which must necessarily arise from its presence. We are, in fact, reducing

what was before performed by a complicated method, to a simple surgical operation ; and, by making one slight incision, we are accomplishing at once what could formerly be only effected by a very slow, or by a very unsafe and painful process ; setting aside, at the same time, the uncertainty and difficulties attending them. It is hardly necessary to adduce any farther argument upon this subject : there are few who will not have the candour to acknowledge, that when an individual can only void his urine by drops,—that when he has frequent attacks of retention of urine,—that when he suffers from incontinence of urine ; and that when, from the pain and irritation arising from the obstruction in the urethra, he has sleepless nights, and is reduced to an extreme degree of emaciation, that the immediate removal of the cause of these grievances is not only an object most desirable to be accom-

plished, but also “most devoutly to be wished.”

I shall here briefly relate, from recollection, one or two cases where this instrument, if it had been invented at the time they occurred, would have been employed with great advantage.

CASE I.

A MAN was admitted into St. Bartholomew's Hospital with retention of urine, to which he had been occasionally subject for some time. The usual means were adopted, leeches, the warm bath, &c. to relieve him: these, however, failed. A very fine catheter was tried to be introduced into the bladder; and at length, with extreme difficulty, it was passed. The urine was

drawn off, and as the patient was suffering pain from the presence of the catheter, it was withdrawn. On the following day there was a recurrence of retention of urine. The catheter was employed, and it would not pass. He was ordered leeches, and the catheter again attempted: this, after some time, passed; but, from the same cause, was withdrawn. The urine now dribbled away from the penis for a day or two, when the patient had a recurrence of retention. This was by the same means relieved: he was, however, attacked, once in two or three days, in the same manner, for some time afterwards; and, at length, from the excessive diseased state of the bladder, died.

This case affords an instance of the utility of the double-lancetted stilette. If this instrument had been employed when the catheter was first passed, it would

have saved the patient the excessive and repeated tortures of retention of urine; and it, perhaps, might have prevented the causes which ultimately terminated in his death.

CASE II.

J. P. having had a stricture for many years, it at length so completely closed up the passage, that the urethra ulcerated behind it, and the urine was extravasated into the surrounding cellular substance. An immense urinary abscess was formed, occupying the whole of the perineum, and more particularly presenting itself on the right nates, at the side of the rectum. At this part a free incision was made into it, and about a pint and a half of the most foetid, urinous, sloughy matter, escaped.

A vast cavity existed in the nates, which extended itself to the perineum. It was impossible to discover where the urine escaped from the urethra, so that it still collected in the cavity, before it passed out at the opening made. The patient had a low irritative fever upon him, resembling typhus in its last stage ; his pulse was 130 ; his tongue black and dry, feeling, when touched, quite rough and hard, and he was delirious. The urine which lodged in the cavity kept up the above symptoms ; and it was, therefore, judged necessary to pass a catheter into the bladder. After many attempts, a very small gum-elastic catheter was, with great difficulty, introduced through the stricture. This remained in the bladder for two days, and the symptoms gradually abated. The patient, however, in a half-delirious state, withdrew the catheter, and the urine lodged in the cavity as before. He became worse :

endeavours were made to introduce the catheter, but they were unsuccessful. On the following day the symptoms increased, and death appeared to be fast approaching. The introduction of the catheter was again resorted to, and after many fruitless attempts, for at least as long a time as an hour, it was at length fortunately passed into the bladder, and it was then so secured he could not withdraw it.—It is unnecessary for me to enter into further details: in about three or four months he recovered.

It may be observed in this case, the extreme difficulty there was in passing the catheter, and the mischief that resulted from the urine collecting in the cavity. The patient, no doubt, would have died if the catheter (which can be considered no other than chance,) had not been introduced the second time, and left in the

bladder. At the time this case occurred, the double-lancetted stilette was not invented; but if it had been, the stricture might have been divided at the first introduction of the catheter, when all farther danger and trouble would have been prevented.

CASE III.

AN old gentleman was affected with partial paralysis of the bladder, for which the catheter was obliged to be passed daily. In addition to this malady, he also was afflicted with a tortuous, indurated, and almost impermeable stricture, which rendered the passing of the catheter extremely difficult. For this reason, whenever there was an accession of inflammation of the part, whether it arose from his having com-

mitted an excess, or from any other cause, he had an attack of retention of urine. These attacks were generally relieved by the warm bath, leeches, &c.; but their recurrence were very frequent, and he lived in continual apprehension of them.— If in this case the stricture could have been divided, it would have rendered the passing of the catheter easy; so that although the paralysis of the bladder might have continued, yet the distressing malady, retention of urine, would have been prevented.

These cases are particularly impressed on my mind. I could, from recollection, relate many others of a similar description. This, however, would be superfluous, as there are few surgeons of experience, and more particularly hospital surgeons, who have not met with such examples.

In retention of urine, also, where the stricture is quite impermeable, it certainly must be allowed to be far better to divide it with the single-lancetted stilette, than to puncture the bladder. Before resorting to so distressing a measure, I have no hesitation in saying that this instrument ought always to be employed; for should it not succeed, the bladder can but be punctured at last. In all cases where the stricture is quite impermeable, and where it would otherwise be found necessary to divide it from the perineum, or to employ caustic (the difficulties and danger of which I have already pointed out,) this instrument might be used, as will be seen by the cases, to great advantage, and thus the necessity of both these remedies would be superseded.

I shall now proceed to the relation of the cases where these instruments have been

employed ; but, before concluding these remarks, I think it necessary to state, that since the invention of these instruments, I have been informed that some of the French and German surgeons have attempted the division of strictures within the canal of the urethra ; but by what means exactly, or with what success, I have been unable to learn.

CASE I.

GEORGE EDWARDS, ætat. twenty-five, admitted into St. Bartholomew's Hospital May 12th, 1826, with stricture of the urethra, under the care of Mr. Lawrence.

About five years ago he first found the stream of his urine diminished in size, from which time until the present it has gradually become smaller and smaller. He has,

for the last eight months, been incapable of voiding it in any other manner than drop by drop, during which time, also, he has had frequent attacks of retention of urine, accompanied with hernia humoralis. He suffers much pain in the region of the pubes, has frequent desire to make water, and there is a deposit of mucus in his urine. His tongue is foul, pulse quick, and his general health much impaired. When his urethra was examined, an impermeable stricture was discovered at the distance of five inches and a half from the orifice, at the glans penis.

He was ordered milk diet, and placed on a strict antiphlogistic regimen. Leeches were applied frequently to the perineum, occasional warm baths used, and the smallest-sized bougies of every description passed as far as the stricture twice in the week, with the hope of permeating it.

June 5th.—All these means having failed, the armed catheter was introduced as far as the stricture, and used as before described. Three-fourths of an inch of the stricture were divided, and, as this was the first time of using the instrument, no farther attempt was made. As it was thought bougies might tend to keep up inflammation, their use was for the present discontinued. In other respects the case was treated as before.

12th.—On the first day after the operation, he made water in a larger stream than he had done for some time past, but on the following day much worse: indeed, for a few hours he had total retention. For this reason the use of the armed catheter was nearly being abandoned; but, as it was suggested that the man might have become worse, owing probably to the reunion of the divided surfaces of the stricture, Mr.

Lawrence gave the instrument another trial. Accordingly, on the following day its use was had recourse to again, and it was found, as suggested, that the divided portion of the stricture had closed. This, with a very little force, and without pushing out the lancet, was separated. An inch more of the urethra, with the aid of this instrument, was passed. A bougie was introduced every day, to prevent the divided part from closing; when, on Friday the 16th, the armed catheter was again employed, and, with one slight puncture with the lancet, passed with the greatest facility into the bladder. It was then withdrawn, and a silver catheter (No. 9,) was introduced instead of it, and a pint and a half of urine drawn off. He was ordered to keep constantly in bed, and to foment the perineum.

17th.—The catheter caused so much irritation that he could not keep it in the

bladder longer than six hours. He had suffered some pain in the perineum, but had slept during the night.

He was ordered to apply twelve leeches to the perineum, to take an aperient draught, and continue fomenting.—The catheter was passed, and withdrawn.

18th.—Had not suffered so much pain; slept tolerably well; and had had his urine drawn off twice without difficulty. Pulse eighty; urine thick, and a sediment of mucus at the bottom of it. The draught had operated three or four times.

To continue fomenting the perineum.

19th.—Had a restless night; felt pain in the perineum, but more in the region of the pubes, and the glands of the groin were swollen. His urine has been drawn off twice, however, without difficulty.

To apply twenty-four leeches,—twelve

to the perineum, and twelve to the groin. To take five grains of calomel and twelve of jalap immediately. Constantly to foment the perineum and region of the pubes.

Any further account of the case I was prevented from obtaining personally, in consequence of indisposition. I afterwards learnt, however, that in a few days the irritation of the urinary organs subsided, and that the man went away nearly cured; but, having discharged himself from the hospital, any further progress in his case was prevented. At this period, however, a catheter (No. 10) could be easily passed, and he suffered no pain whatever.

CASE II.

JOHN PREDAM, ætat. forty-seven ; February 1827. Has been afflicted with stricture of the urethra for about five or six years, during which time he was admitted as a patient into various hospitals and dispensaries, sometimes with and sometimes without relief ; but he has never been completely cured. He now suffers much pain in voiding his urine, which passes from him drop by drop, and he has not been able to have the smallest-sized bougie passed into the bladder for the last six months. In other respects he is in perfect health. Upon examination of his urethra, it was discovered that he had a stricture seven inches from the orifice ; and, frequent attempts having been made to pass a bougie through it without success, it was resolved to divide it with the armed stilette.

Feb. 14th.—Having ascertained the exact distance of the stricture from the extremity of the urethra, the armed stilette was passed down to it, and it was divided without much difficulty, with but little pain and slight hæmorrhage. There was then substituted a silver catheter of the same size, which was left in the bladder.

He was ordered to take an aperient draught, to foment the perineum constantly with hot water, and to remain in bed.

15th.—He experienced so much pain that he could not keep the catheter in the bladder longer than eleven hours, when it was taken out. He has had almost a sleepless night, but, since the removal of the catheter, has not felt much pain in the perineum. Pulse ninety, and skin rather hot.

Apply twelve leeches to the perineum; to continue fomenting.—The catheter was again passed, and left in the bladder.

16th.—The catheter had remained in the bladder since its last introduction ; but its presence had caused considerable pain, which he attributes to its want of pliability, and its striking, when he moves, against the coats of the bladder ; it therefore was withdrawn altogether. Pulse eighty-four ; skin still hot ; no sleep ; and there was a sediment of mucus in his urine.

To take an opening draught ; to apply twelve leeches to the perineum, and to continue fomenting.

17th.—The pain in the perineum had nearly subsided, and he had made water twice without difficulty. The catheter was passed into the bladder with the greatest ease, and was immediately withdrawn. As the draught had not operated sufficiently, he was ordered to repeat it. Pulse eighty-four ; slept better ; skin cooler.

18th.—Still less pain in the perineum. His bowels had been relieved freely, and he had slept well during the night ; pulse seventy-six ; skin cool.

The catheter was again introduced.

19th.—Much better : feels pains only when micturating. Catheter passed without trouble. Pulse seventy-four ; skin cool.

20th.—Still feels slight pain while voiding his urine, but all other unpleasant symptoms have vanished.

Catheter was passed, and he was ordered another aperient draught.

21st.—Free from pain altogether ; feels himself quite well. He makes water without pain, and in a good-sized stream.

For about a month after this period, a

large-sized catheter (No. 12) was passed into the bladder, without the slightest impediment, twice in the week. He now voids his urine with the greatest freedom, in as large a stream as natural, and without the least pain. Since this time I have seen him frequently, and no obstruction whatever remains in the urethra.—*July 1828.*

CASE III.

APRIL 4th, 1827.—Michael Barry, ætat. fifty-one. This man had been suffering so long with stricture of the urethra, that he could not recollect when he first observed the diminution of the size in the stream of his urine. At present, and for the last two months, however, he has been only able to pass his urine drop by drop, and then with so much pain that his life has been rendered quite miserable to him.

Many trials have been made to pass bougies of all sizes, from the largest to the smallest, without avail. Upon measurement, the stricture was found to be situated three inches and a half from the glans penis. The armed stilette was introduced to that part, and the stricture divided, with but little pain and slight hæmorrhage. The instrument was then withdrawn ; and, as it was discovered that another stricture existed in the membranous portion of the urethra, which would not admit of the passage of a catheter larger than No. 5, it was judged necessary not to introduce the gum catheter, but only to pass a bougie through the divided stricture every day. This was done for a fortnight, without the least inconvenience, and the other stricture was treated in the usual manner. In about six weeks both were cured ; and the man can now make water as well as ever he did in his life.

During the treatment, leeches were applied to the perineum ; purgatives given as often as the symptoms demanded them ; and the antiphlogistic regimen strictly adhered to.

CASE IV.

RICHARD LEGG, ætat. forty-four, admitted into St. Bartholomew's Hospital, with impermeable stricture of the urethra, under the care of Mr. Earle, 28th Sept. 1827.

In his youth he had experienced several attacks of gonorrhœa, which, in the second stage, were usually cured by astringent injections. During sixteen years he has been afflicted with a stricture of the urethra, which has been more or less troublesome to him, sometimes causing him to

make water with extreme difficulty, and at others, in a tolerably-sized stream. For the last two years, however, his urine has infiltrated itself through the contracted part only by drops, accompanied with great pain and straining while voiding it, and often being totally suppressed. His health is much impaired; he has frequent attacks of rigor; and, in consequence of a perpetual fear of retention of urine, he has been obliged to give up his employment. The stricture is situated at the distance of five inches and a quarter from the orifice: it is quite impermeable, and appears to be of an indurated and cartilaginous character. No bougie, or instrument of any description, has been passed through it for five years; and, though frequent attempts have been made since he has been under treatment at the Hospital, yet not the slightest benefit has been derived from it. Thus circumstanced, he was determined to undergo

any operation that might relieve him ; and it was first suggested to divide the stricture from the perineum ; but, as cases of this description had already been permeated by the armed catheter, Mr. Earle decided upon making use of this instrument.

Oct. 19th.—The lancetted stilette was passed as far as the stricture, which, as before stated, was five inches and a quarter from the orifice. The lancet was then thrust forward, and allowed to retreat, and the blunt point of the instrument urged cautiously along the course of the urethra. With about three punctures three-fourths of an inch of the stricture were divided, giving apparently but little pain. The ground already gained being considered sufficient for the present, the catheter was withdrawn ; and, to guard against inflammation, he was desired to keep in bed, to foment, and apply twelve leeches to the

perineum, and to take an active purgative.

20th.—He had experienced no unpleasant symptom whatever from the operation ; but rather felt himself relieved, being able to make water in a larger stream. He felt no pain, his pulse was tranquil, and he had slept well during the night. On this day he required no medicine.

24th.—An instrument was passed to the stricture, and it was found that the part divided had not closed. He still felt himself benefited, and was very desirous of having the same instrument again employed.

27th.—On this day the remaining portion of the stricture was pierced with one incision of the lancet, and the catheter passed with the greatest ease into the blad-

der, and left there for about two hours; when a gum elastic (No. 10) was introduced in its place. He was ordered to remain in bed, and to foment the perineum.

28th.—He had suffered but little pain, and had slept well. Pulse seventy-six; skin cool, and tongue clean. He requires no medicine. Ordered still to wear the catheter and foment.

29th.—Much the same as yesterday, in every respect.

30th.—Still going on well.

31st.—The catheter was withdrawn: no medicine required.

Nov. 1st.—A catheter passed (No. 10), and he was desired to keep it in the

bladder for one hour. He gets up as usual.

Since this period a catheter has been passed daily, gradually increasing the size until it reached No. 13. On Nov. 20th he was discharged from the Hospital, perfectly cured; and not the slightest remains of the stricture could be perceived.

CASE V.

MATHIAS MELJASO, a sailor, with an impermeable stricture, of twenty-seven years standing.

In the year 1800 he fell through the hatchway of a ship, and struck his perineum against some broken casks which were at the bottom of the vessel. After

recovering from the temporary shock which the blow occasioned, he felt an uneasiness while his urine passed through the urethra : but not finding any particular inconvenience from it, he made no complaint until 1815. At this period he was at least twenty minutes or half an hour in expelling the contents of his bladder. He then applied to a surgeon, who endeavoured, at various times, to pass a bougie for him ; but he was always frustrated in the attempt, being unable to get it farther than the stricture. In this miserable condition the poor fellow remained until 1826, when he was seized with retention of urine. On his recovery from this attack, the surgeon who attended him employed caustic bougies, with the view of destroying the stricture. Instead of this, however, (which so frequently happens,) a false passage was made by the employment of this remedy.

On Sept. 1827, he was admitted into St. Bartholomew's Hospital; and the present state of his urethra is as follows.—There is an impermeable stricture five inches and a half along the canal, and about half an inch anterior to it a false passage is formed, at least an inch in length. On passing the bougie to the contracted part, which is difficult on account of the false passage, it causes considerable pain; and, on withdrawing it, it is always followed by a flow of blood. He suffers much pain while making water, it flows only by drops, and he is nearly an hour in voiding it.

Oct. 29th.—The armed stilette was used, and one inch of the stricture was divided. He did not feel more pain, nor was there more hæmorrhage, than when a common bougie was passed. On the following day a metallic bougie was passed to the stric-

tured part, when, with slight pressure, a band appeared to give way in the urethra, and the bougie (No. 9) slid gradually into the bladder. On the following day he had suffered no inconvenience;—the bougie passed with ease, and he made water in a good-sized stream, which he had not done before since the year 1800. As no constitutional symptoms arose, no particular treatment was necessary: a catheter, therefore, from this period, was passed every day, and its size gradually increased. At present (Nov. 20th) No. 12 can be introduced with the greatest ease, the stricture has disappeared, and his health is quite restored.

CASE VI.

EDWARD BULL, ætat. forty-five, a sailor. He was invalided from his Majesty's service

in 1811, in consequence of an ill state of health, produced by the extreme irritation which arose from a stricture in the urethra. At that period his urine used to ooze constantly from the penis, so that his clothes were always wet. He was much emaciated, and his health was gradually declining. In 1815 he consulted an eminent surgeon, who discovered that he had a stricture. Bougies were passed until a cure was nearly effected. After this time, however, he neglected his complaint until January 1826, when he became so ill from the difficulty of voiding his urine, that he procured an admission into St. Thomas's Hospital. Here he stayed for some little time; but experiencing no relief, he left it.—He became worse, was re-admitted into that Hospital, and at length was discharged incurable. On April 6th, 1827, he was received into St. Bartholomew's Hospital, under the care of Mr. Earle.

On passing a bougie, its progress was arrested about six inches from the orifice; and, as no passage could be effected, the stricture was divided from the perineum (June 9th, 1827). The operation was attended with many difficulties, from the hardened state of the parts round the canal, which resembled cartilage; but not having been present, I am unable to describe them. A catheter, however, was at length passed; and, in about three days afterwards, the patient incautiously allowed it to slip out. Several attempts were made to introduce it again, but without success. The wound in the perineum had nearly closed, when it was thought necessary to make a fresh incision, and to pursue the same method as before. This was attended by the same result. The wound again completely closed, and the patient's health began to suffer materially from the disease. He now could only make water in

drops, and with considerable pain. In this miserable state the patient continued, having but little hope of relief, until Oct. 10th, when the armed stilette was used. The stricture was completely impermeable, and it was divided by this instrument until it arrived at the prostate, when, on account of the extreme enlargement of this gland (being nearly as large as a turkey's egg), it would not, on this day, pass any farther. On the day following, however, a catheter (No. 8) was passed completely into the bladder, and left there; and its size was gradually increased to No. 12, which can at the present time be passed with great ease, and no obstacle now remains. The wound in the perineum is closed, but on account of the excessive diseased state of the prostate gland, the patient has lost the power of voiding his urine of his own accord: the catheter, therefore, is obliged to be passed whenever he wishes to relieve

his bladder. He has greatly improved in health; and, finding no difficulty in passing the catheter, he feels grateful for the benefit he has experienced from the treatment.

CASE VII.

DEC. 26th, 1827.—John King, ætat. thirty.

The history he gives of himself is as follows: that, having been a post-boy, and ridden a great deal, he had frequently struck his perineum and penis against the pommel of the saddle, from which he attributes the origin of his stricture. About a year previous to the present time he was a patient in St. Bartholomew's Hospital for this disease; and he was then relieved by

the urethra having ulcerated behind the stricture, and thus a new passage for the urine, anterior to the testes, was formed. He then discharged himself from the Hospital, and has made water by this channel ever since. This he accomplishes, however, with great difficulty, as he is obliged to pass a straw through the false passage every time he voids his urine, to facilitate its escape. Upon examination, an impermeable stricture was present three inches from the orifice, which extended to the length of two inches along the urethra, feeling at that part just as if a hardened cord had been placed there. I passed a small catheter through the fistulous opening into the bladder, which entered the urethra five inches from the orifice. I then introduced the armed catheter, and by degrees divided the stricture until I arrived at the catheter, which was introduced through the false passage. Both the catheters were then

withdrawn, and an elastic gum one passed into the bladder. The presence of this, however, kept up bleeding from the urethra; it was, therefore, withdrawn, and the hæmorrhage immediately ceased. On the evening of the same day I saw him again. He had suffered no pain, excepting at the time the urine had made its escape through the divided portion, which it had done partially. On the following morning he left the Hospital, assigning as a reason that he had some particular business to transact. He had slept well during the night. He never returned, so that the termination of the case cannot be known. It is probable, however, the stricture having been divided, had he stayed he would have been completely cured.

CASE VIII.

J. M., ætat. thirty-seven—Jan. 1828, has been suffering from stricture in the urethra for many years; and, from my own knowledge, it has been impermeable for the two latter. From the excessive irritation produced by the disease, he is reduced almost to a skeleton, and has become excessively dejected. He assures me he has not slept for two hours together for two years; indeed, hardly one hour elapses without an inclination to make water, and he is immediately obliged to rise from his bed to relieve himself. The stricture is situated six inches from the orifice; and, in addition to it, there is an enlargement of the prostate gland. Although this latter affection was rather unfavourable, yet, from the extreme sufferings of the patient, the armed stilette was

introduced, and half an inch of the contracted portion of the urethra divided on the first day of its employment. The usual methods, leeches, &c. being prescribed, no bad symptoms arose in consequence; so that in two days afterwards (Dec. 13th), the rest of the stricture was, by the same means, permeated. Fomentation and local blood-letting from the perineum were repeated, and the catheter passed as far as the prostate gland; but, in consequence of its enlargement, I found it difficult to get it any farther, and therefore did not persist in its introduction.

On the next morning after the operation he informed me that he had slept four hours together (which he had not done for a period of two or three years before), and that he had made water in a tolerably-sized stream. From this time he improved in health, became fat, and regained his

strength. A catheter (No. 12) could be passed as far as the prostate, but I never could enter the bladder. His urine, however, continued to flow from him freely ; and he felt quite content to be so far relieved.

CASE IX.

JOHN PRATT, ætat. thirty-seven, an unhealthy looking man, has been afflicted with permanent stricture for upwards of fourteen years, occurring after gonorrhœal inflammation. For the last two years he has only voided his urine by drops. The smallest-sized bougies have latterly been repeatedly attempted to be passed, but without effect. In the month of November last, suffering for two days with retention of urine, he was cut in the perineum, by

a surgeon in the country : a catheter was introduced through this opening into the bladder, anterior to the stricture. After the lapse of a week or two, attempts were again made to pass an instrument through the natural passage, but the stricture did not yield in the least. The catheter had remained in the opening through the perineum for above seven weeks, when the patient incautiously allowed it to slip out. He made several attempts to introduce it, but was unable ; and the surgeon not being able to see him for a week after this occurrence, the wound completely healed, and the stricture in the urethra remained as permanent as ever.

On the 30th Jan. 1828, he was admitted a patient into this Hospital. Upon examining the urethra several strictures were found to exist, the principal one being about four inches and a quarter from the

external orifice. Such was the contracted state of the canal at this part, that the smallest catgut bougie could not be passed. His urine is constantly dribbling from him; and, as stated above, he has not made water in a stream for more than two years. There is also a good deal of irritation about the rectum, the patient being frequently subject to tenesmus and hæmorrhage. This was considered a fit case for the trial of Mr. Stafford's newly-invented instrument. It may also be right to mention, that the prostate did not appear to be much enlarged.

On the 5th February, the patient being in a better state of health than at the time of his admission, Mr. Stafford's instrument was introduced down to the stricture, which was divided to the extent of a quarter of an inch. This operation gave the patient but little pain: no bleeding whatever took

place. The sensation conveyed to the hand of the operator was similar to that of cutting a piece of cartilage. An attempt was now made to introduce a gum catheter, but without effect: it was considered probable that the stricture had not been completely divided; but it was deemed safer to wait a day or two, than to subject the patient to pain and irritation, which a fresh introduction of the instrument would most likely occasion. He was ordered castor oil, the parts to be well fomented, and to keep the recumbent posture. About an hour after the operation (two P. M.) he made water in a very small stream, and was free from pain*. At eight P. M. he was

* Upon inquiry, he informed me, that in making water he grasped the penis at its extremity, which he was accustomed to do, to assist himself in this operation. It is probable, that by retaining the urine in this manner in the urethra, that some of it became in-

attacked with a small rigor, and a desire of making water, with considerable pain down the urethra, and about the neck of the bladder : the kidneys were also sympathetically affected. At nine P. M. these symptoms became more alarming, countenance flushed, the whole body covered with a profuse sweat, pulse quick and irritable; and he has a great desire of making water, but none has flowed since the afternoon; bladder slightly distended; both testicles are swollen, and are acutely painful; the perineum is tense, and painful on pressure. These symptoms were relieved by the application of five-and-twenty leeches to the perineum, followed by the use of the warm bath, and the exhibition of an opiate clys-

filtrated into that portion of the stricture which was divided, and thus the irritation which subsequently occurred was produced.—*The Author.* -

ter: in about four hours afterwards he voided about a quart of urine.

Feb. 6th.—Inflammatory symptoms have not yet subsided: ordered him *hirudines xxx. perineo, postea cataplas. panis; haust. salin. c. ʒ iij. ant. tart. ʒ ss. sextis horis*. At ten P. M. he was free from pain, and felt inclined to sleep.

From the tense and painful state of the perineum, it was thought proper to make an incision down to the urethra; and, upon dividing this, about a table-spoonful of pus escaped: this gave the patient almost immediate relief. Pus and urine continued to be discharged from this opening for several days.

On the 8th March, the patient being in a tolerably quiet state, the lancetted stilette was again used, and the stricture com-

pletely divided. An elastic catheter was with great facility passed through the stricture into the bladder, and left there. In a few days the wound in the perineum healed, his health was completely restored, and he could make water as well as he ever had done. In the beginning of April he went into the country, and at that time a No. 12 catheter could be passed, and all obstruction in the urethra had vanished.

For the notes of this case I am indebted to Mr. Tarral.

CASE X.

IN 1825 I had gonorrhœa, of which I got perfectly cured: about twelve months after, I had a swelled testicle, brought on by jumping; I was compelled to wear a

purse-truss for some months. I discovered that in the part where the tape of the truss pressed, I had a slight scalding when I made water; I took no notice of this for some months, but left off the truss. It became so painful that I applied to a surgeon, and he passed a bougie, and discovered it was a stricture. Passing a bougie brought on the swelled testicle, and I was again compelled to wear the truss. I had a bougie passed twice or thrice a week, till I was considered cured. In March 1827, the urethra became so contracted that the water could not pass: I was then compelled to have immediate relief; and, with the greatest difficulty, a small catheter was passed, but not large enough to draw off the water. This brought on an irritation of the nerves, palpitation of the heart, and a violent hiccough, which lasted nine days, and was stopped by Mr. D.: I was confined to my room for three months. I

could pass my water in a stream the size of a small wire, till the November following, when the water again stopped, and I was compelled to have immediate relief: a small catgut bougie was then passed; a palpitation of the heart again followed, and I was kept from business five weeks. Caustic bougies were passed to the stricture, but would not decrease it in the least. I could not hold my water after this date. I had the advice of two of the most eminent surgeons in London, but without effect; and remained making water only in drops till 1st February last, when I made application at Bartholomew's Hospital, and had the good fortune to be placed in Mr. Earle's ward.

On the first day of my being in the hospital, Mr. Earle tried to pass a small bougie, No. 1, but could not. I had warm baths every night for a week, and

Mr. Earle then tried to pass a small wire, but without success. After this Mr. E. tried to pass a wax bougie, but so hard was the stricture that several of them were bent, and would not enter the stricture. I was in the greatest agony possible, trying and straining to make water twice or thrice an hour, night and day, and could only make a few drops at a time. I had been in the hospital nearly five weeks, when my bladder became so diseased that Mr. Earle found it necessary to make a passage, and he tried every means on the 1st March last, but without effect*. I

* The stricture was partly divided with the lancetted stilette. On the following day the catheter was passed, owing, no doubt, to the other portion of it having ulcerated from the puncture, and in this opinion Mr. Earle accords. This stricture could be felt exteriorly, and the canal all around was of a stony hardness.—*The Author.*

was in the operation-room of the hospital nearly forty minutes on this day. The next day (Sunday), Mr. Earle was kind enough to try again to make a passage, and in less than ten minutes he succeeded in passing a small catheter, and the water instantly came in a better stream than it had for twelve months before. I have not had any palpitation of the heart, or any pain or irritation, since. On the Tuesday following, Mr. Earle succeeded, without the least pain to me, in passing a gum catheter, double the size of the first; and, on the Saturday following, Mr. Earle passed one nearly double the size of the second.

I am now in better health, can pass my water better, and have less pain, than I have had for ten months before. My water is now quite clear; and, instead of making ten or twelve drops at a time, and

even that with a great deal of pain, I can now pass nearly a pint without the least pain or smarting whatever.

JOHN WISE,

23, UPPER CLIFTON-STREET, FINSBURY,

March 10, 1828.

DEAR SIR,

In reply to your inquiries respecting Mr. A. lately Surgeon in the Honourable Company's Service, in whose case I employed your instrument, I beg leave to state that I was requested to see him on Saturday, the 22d of December, under the following circumstances :

He had been labouring for above twenty years under the most distressing symptoms from strictures. In the East he had been

frequently obliged to wear a small catgut bougie in the urethra, during his campaigns, and had been constantly liable to alarming retentions of urine. Caustic bougies were employed very freely, both by himself and others, and, since his return home, one gentleman had passed the caustic bougie above sixty times, without making the slightest progress. The smallest catgut bougie could not be passed beyond three inches and a half down the urethra. When he wished to relieve the bladder he was generally obliged to introduce the bougie to this spot, on withdrawing which the urine flowed guttatim, and sometimes in a very small continued stream. Latterly he had been under the care of another practitioner, who had passed caustic bougies twice a day for some time, without at all advancing; and this gentleman, perceiving that his health was fast breaking, that his nights were passed

without rest, and that he had repeated severe rigors, proposed to puncture his bladder through the rectum, as the only means to save his life. Previously to submitting to this operation he requested my opinion: I found him in a most distressing state of nervous irritation, with a haggard and most anxious countenance, and it was at once obvious that he could not long survive under such circumstances. He had a constant copious discharge from the urethra, at the entrance of which I found a very narrow stricture, which I have no doubt was the original cause of all his suffering: this was partly from natural formation, increased by inflammation and the continual irritation of the caustic applications, which had blackened the mucous lining of the urethra. Beyond this, at about two inches and a half down, the urethra again contracted to so narrow a passage that

the smallest bougie had not been passed through into the bladder for many years. I endeavoured to calm his mind, and proposed to divide the narrow orifice to the urethra, as a preliminary measure. To this he most readily consented; and after the operation I was enabled, with some difficulty, to pass in a No. 12 catheter down to the second stricture. This first operation afforded him some relief; he expressed himself as most grateful for it, and had fewer spasmodic attacks and no rigors. I was very anxious to defer any other operation, and to endeavour to tranquillize his urethra and restore his general health; but he was most urgent for me to proceed, and even said, "If you do not soon relieve me, I fear that I shall rush into the presence of my Maker unprepared." Under these circumstances, and against my better judgment, I performed a second operation, with an instrument made after your plan,

only quite straight. This instrument was of the full size of a bougie No. 12, and was with some difficulty carried down to the second stricture, causing rather a painful distention of the urethra. This circumstance prevented my using the instrument with that freedom and facility which is desirable. With much difficulty I cut through a very tough substance, to the extent of three-quarters of an inch, and followed it up with a metallic bougie to that extent. A very few drops of blood followed the operation, which I felt unwilling to pursue farther on that day. In the evening he had a slight rigor, but the urine flowed more freely than it had done for years. The following day there was a slight erysipelatous blush, with tenderness on pressure over the pubes and in the course of the urethra. Leeches and fomentations were applied, which abated the inflammation so much that I did not

consider it necessary to cut down, which I had determined to do if there was any threatening of abscess from effused urine. Two days after the operation, the irritation was sufficiently subdued to enable me to introduce a metallic catheter to the full extent to which I had divided the stricture. This caused some pain and a return of the rigors, but no increase of swelling, or erysipelas. The following day his stomach became very irritable, and he rejected his food with frequent and most troublesome hiccoughs. These symptoms continued with unabated violence, until death put an end to his sufferings, the 11th of January. The urine continued to flow at intervals during the whole time, and there were no local circumstances warranting any operation, on the supposition of the symptoms depending on effusion of urine.

On examination after death, there was

sloughing of the cellular membrane to a slight extent under the integuments of the pubes, and this was connected behind the scrotum with the diseased portion of the urethra. On slitting up the urethra, no direct communication could be traced between that canal and the sloughing cellular membrane. The stricture was nearly divided through, and had I persevered to the extent of about a line and a half further, I should have opened into a healthy part of the urethra, and have been able to carry my instrument on into the bladder, as no very material obstacle presented itself between the second stricture and that viscus. The bladder was much thickened, and the mucous coat in part ulcerated, in other parts covered with a very firm incrustation of lymph, giving it the appearance of the lining of a bird's gizzard. The prostate was not much enlarged. The mucous coat of the stomach was much inflamed, and the

liver was diseased. In reflecting on this case, I regret that I performed the operation at all, under such very unfavourable circumstances, and having commenced it, I regret that I did not employ a smaller instrument, and cut more boldly on to a greater extent. Having performed the operation, and the unfavourable symptoms having occurred, I lament that I did not at once cut down through the integuments of the scrotum, and divide the remaining portion of the stricture. But the symptoms did not appear to warrant such a proceeding. You are at liberty to make any use of this brief sketch of the case that you may wish.

Believe me, truly yours,

H. EARLE.

GEORGE-STREET, July 15th, 1828.

P. S. I may just add, that I have now employed your instrument in eight cases—

in six with perfect success, in one with partial relief, and in the case above recorded with a fatal termination.

As the present case is the only one where the use of this instrument appears to have been attended with want of success, I feel it necessary to make a few remarks upon it. It appears to me very doubtful whether the patient died from its employment. He was in the last degree of exhaustion before the operation was performed; and of this he himself appeared fully conscious, from the strong expression he made use of,—“If you do not soon relieve me, I fear I shall rush into the presence of my Maker unprepared!” The state of the body after death, also, does not warrant us in believing that he died alone from this cause. We may observe,

as well as there being “a sloughing of the cellular membrane to a slight extent under the integuments of the pubes, which was connected with the scrotum,” that “the bladder was much thickened, its mucous coat in parts ulcerated ; and, in other parts, covered with a very firm incrustation of lymph ;” and that also “the mucous coat of the stomach was much inflamed, and the liver diseased.”

These latter causes were more likely to have produced death than the operation ; and more particularly when, “on slitting up the urethra, no direct communication could be traced between that canal and the sloughing cellular membrane.”

The following are the cases where I have divided Permeable Stricture with the double-lancetted stilette.

CASE I.

DEC. 10, 1827.—John Sych, ætat. seventy, has suffered from strictures twenty-three years ; during which time he has frequently endeavoured to dilate it with bougies ; but immediately on leaving off their use, the passage has again closed. During this period he has had frequent attacks of retention of urine ; but for the last ten years past, he has been afflicted with incontinence of urine, so that he has been unable to keep his clothes or his bed dry. Upon examination I found a stricture six inches from the orifice, through which I could only pass a catheter No. 1 ; and, as the contraction, when dilated, had

always closed again, I resolved to use the double-lancetted catheter: I accordingly introduced the wire through the catheter, withdrawing it, and leaving the former in the urethra. I then passed the armed catheter over it; and, when it arrived at the stricture, I pressed upon the handle of the stilette, and protruded the lancets. By two incisions the stricture was divided, and the catheter No. 10 was left in the bladder. The operation gave but little pain, and there was but very slight bleeding. The patient, in fact, was astonished that so large an instrument could be got into the bladder, not being aware that it had been divided. On the evening of the same day he felt pain in the urethra, and there appeared to be a disposition to inflammation: the catheter, therefore, was withdrawn, and leeches applied to the perineum, besides its being constantly fomented.

11th.—He had felt a little restless during the night; but, upon the whole, he had slept tolerably well. His pulse was quiet, being only seventy-five; and he had had no unpleasant symptom. A catheter, No. 11, was passed with the greatest ease. Since the operation his urine has not flowed involuntarily, and he has been able to retain it in the bladder. He was ordered twelve leeches to the perineum, to take an aperient draught, and to foment: if necessary, also, to take an opiate at night.

12th.—He had slept well during the night; his pulse still remained quiet; and he had had no untoward symptom: he only feels pain as the urine passes through the divided part. A catheter was passed, and he was ordered to continue fomenting.

It is unnecessary for me to give any far-

ther history of this case. The patient went on so well that he quite recovered in a fortnight. No. 13 catheter could be passed without pain, and with great ease. He now has no incontinence of urine, and he makes water with the greatest freedom. He continues well (June 30th, 1828); and his health is as good as an old man of seventy can expect.

CASE II.

JOHN HAWKES, æt. fifty-one—Feb. 1828, has suffered from stricture for about twenty years, which has reduced him to an extreme degree of emaciation. He has at various times been under treatment at different hospitals, but never with complete relief. At present the disease is more aggravated than it ever has been. He suf-

fers great pain, he has sleepless nights, and makes water with great difficulty. Upon examination I found he had a stricture three inches from the orifice, and he complains that when the urine arrives at this part, it is suddenly stopped, and that it is infiltrated through it by drops. The stricture, which could be felt externally, (the urethra being hardened for at least half an inch) would only admit a very fine wire. Over this I passed the straight double-lancetted stilette, and divided the stricture. On attempting to pass a catheter, I found another stricture in the membranous portion. This was of an inflammatory character; I therefore treated it by the ordinary means, and passed a bougie through the divided one daily, which was cured in a fortnight. In six weeks the other also got well, and the man was completely restored to health.

CASE III.

A. B. ætat. sixty-four—March 1828, has suffered from stricture for many years, during which time he has had all those distressing symptoms attendant upon that disease. He has been unable to void his urine in any other manner than in drops; he has frequently suffered from retention of urine, and he now has a perpetual desire to make water, which in the night-time prevents his sleeping. Frequent attempts have been made to dilate the stricture, which is situated four inches and a half from the orifice; but it is of so cartilaginous a hardness, that they have always been unsuccessful. The smallest sized catheter can be at present passed through the contraction, but with great difficulty.

On March 7th, Mr. Chevalier (to whose

kindness I am indebted for the case,) and myself employed the double-lancetted stilette. The catheter, containing a wire, was introduced, and the former withdrawn, while the latter was left in the canal of the urethra. The stilette was then passed over the wire, and when arrived at the stricture, the lancets protruded. These evidently incised the contraction, but the blunt point of the stilette would not pass on. The lancets were again employed, without apparently giving pain. The stricture appeared to yield, but the instrument would not entirely pass through it, owing, no doubt, to the excessive hardness and the inelastic and unyielding nature of the contraction. For this reason it was withdrawn, and a smaller catheter (No. 6) introduced, which passed readily into the bladder. This was securely fixed, and the patient was desired not to withdraw it. On the following day he said he had suffered

some pain from its presence during the night; but his pulse was not accelerated, nor was there any feverish symptom. He was ordered a purgative draught, leeches, and a fomentation to the perineum, and the catheter was withdrawn. On the next day all inflammatory symptoms had subsided. A catheter (No. 8) was passed and withdrawn: no medicine required.

From this time a catheter was passed daily, gradually increasing its size; and in about three weeks or a month the stricture was perfectly cured, and all the consequent symptoms from its presence had vanished.

CASE IV.

MARCH, 1828.—J. S. has a contracted orifice of the urethra, which will only admit

through it a very small bougie ; and the part around it, at the point of the glans penis, is of a stony hardness. The orifice of the urethra was enlarged to its natural size, and a wedge made of a portion of bougie introduced, and constantly kept there, to prevent its closing. The divided portion secreted pus, and then healed, and the induration decreased. In about a month the decreased part was restored to its healthy condition.

CASE V.

WILLIAM HOULST, ætat. fifty-four—April 1828. The exact period when he first perceived he had a stricture he does not recollect ; he believes it to be, however, fourteen or fifteen years ago. For the last five or six years he has suffered great inconve-

nience from it, having a constant desire to make water, and the stream not being much larger than a hair. About five years ago he was under treatment for it, but since this period it has returned. The stricture is situated four inches and a half from the orifice ; a very small bougie can be passed through it, and it appears to be of a hardened structure. For this reason I considered it to be a case well adapted for the use of the double-lancetted stilette ; and on April 27th I made use of it. After having introduced the smallest-sized catheter, containing the wire, through it, I left the latter in the urethra. The double-lancetted stilette was then passed over the wire down to the stricture, and it was divided with great ease. The operation gave but little pain, and there was hardly any bleeding. The patient remarked, that when a bougie was passed for him formerly, it gave him quite as much, if not more

pain, than the passage of this instrument. A gum-elastic catheter was introduced into the bladder, and left there, and the patient was ordered to remain in bed, to foment the perineum, to be placed on farinaceous diet, and to take a brisk purge.

April 28th.—He had suffered but little pain from the presence of the catheter, had had three or four hours' sleep during the night, and felt himself, upon the whole, tolerably comfortable: no medicine required.—To continue fomenting.

29th.—Much the same as yesterday ; but expressed a wish for the catheter to be withdrawn: this was accordingly done. His aperient draught was repeated, and the fomentation still employed.

30th.—Still going on well. The catheter was passed.

From this period the catheter was passed daily, the same treatment continued ; and, in three weeks he was perfectly cured.

It is almost needless to make any farther remark on these cases—they speak for themselves: nevertheless, it may be observed, that they were all of the most obstinate and aggravated description, and that they had resisted all other means of treatment. Some of the strictures had been of four, six, eight, sixteen, seventeen, twenty, twenty-three, and twenty-seven years' duration ; others had been treated by caustic, with bad consequences ; and, in two instances, the strictures had been divided from the perineum unsuccessfully. The pain is trifling ; and the cure, also, of strictures by this method is permanent, and at the same time it is very speedily accomplished, the average time before the part is restored to its healthy condition being

from three weeks to a month: for, although in some cases the patients remained under treatment for a longer period (particularly Richard Legg and Mathias Meljaso), to ensure a more complete cure, yet a full-sized catheter could be passed without pain long before they were discharged from the hands of the surgeon.

From the experience which I have now had of the lancetted stilettes, and from the success which has attended their use, I have every reason to hope that these instruments may, in some cases, supersede the necessity of more serious operations; and in others, afford relief with more certainty and less delay than the means at present employed.



EXPLANATION OF THE PLATE.



FIGURE 1. The Instrument, as commonly seen.

- No. 1. Thumb-piece of the Stilette.
 2. Screw of the Stilette.
 3. The regulating screw.
 4. Hole for the wire to pass through.

Figure 2. As seen with the lancets projecting.

- No. 1. Thumb-piece of the Stilette.
 2. Regulating screw.
 3. Lancets projecting.
 4. Hole for the wire.

Figure 3. As seen with the Instrument passed over the wire, and the lancets projecting.

- No. 1 & 2. Thumb-piece and regulator.
 3—3. The wire as seen passed through the hole at the thumb-piece and at the extremity.
 4. The lancets projecting on each side of the wire.

Figure 4. The Stilette, with the wire passed through.

- No. 1. The thumb-piece.
 3 & 4. The screw and regulator.
 5. Straight part of the Stilette.
 6. Spiral tube to bend to curve.
 7. The lancets.
 8—8. The wire.

Figure 5. A straight Instrument of a similar description.

No. 1. Thumb-piece.

2. Regulating screw.

3. Lancets projecting.

Figure 6. A straight Instrument of a similar description, with a single lancet.

No. 1. Thumb-piece.

2. Regulating screw.

3. The lancet projecting.

Figure 7. The Stilette of the Single-lancetted Catheter.

No. 1. Thumb-piece.

2 & 3. Screw and regulator.

4. Straight part of the Stilette.

5. Spiral tube to bend to curve.

6. The lancet.

Figure 8. The Single-lancetted Catheter.

No. 1 & 2. Thumb-piece and regulator.

3. The lancet projecting.

Figure 9. Smallest-sized Catheter, with a wire passed through.—The use of this instrument is, to introduce the wire (which serves as a guide to the Double-lancetted Catheter) into the bladder. When introduced, the wire is pushed, and the Catheter (which is open at its point) withdrawn, by which the wire is left in the canal of the urethra.

Figure 10. The hole in the thumb-piece through which the wire passes.

Figure 11. The hole at the extremity of the Catheter through which the wire passes.

* * * The Maker of these Instruments was Mr. Fergusson, Giltspur-Street, St. Bartholomew's Hospital.

THE END.

